

# **Brunswick Steam Electric Plant Units 1 and 2**

Extended Power Uprate  
October 24, 2001



**CP&L**

A Progress Energy Company

# Agenda

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|--------------------------------------|---------------|
| ● Opening Comments                   | Jeff Lyash    |
| ● Project Overview                   | Bob Kitchen   |
| ● Regulatory Reviews                 | Dave DiCello  |
| ● Brunswick Unique<br>Aspects of EPU | Mark Grantham |
| ● Open Discussion                    | All           |

# Meeting Objectives

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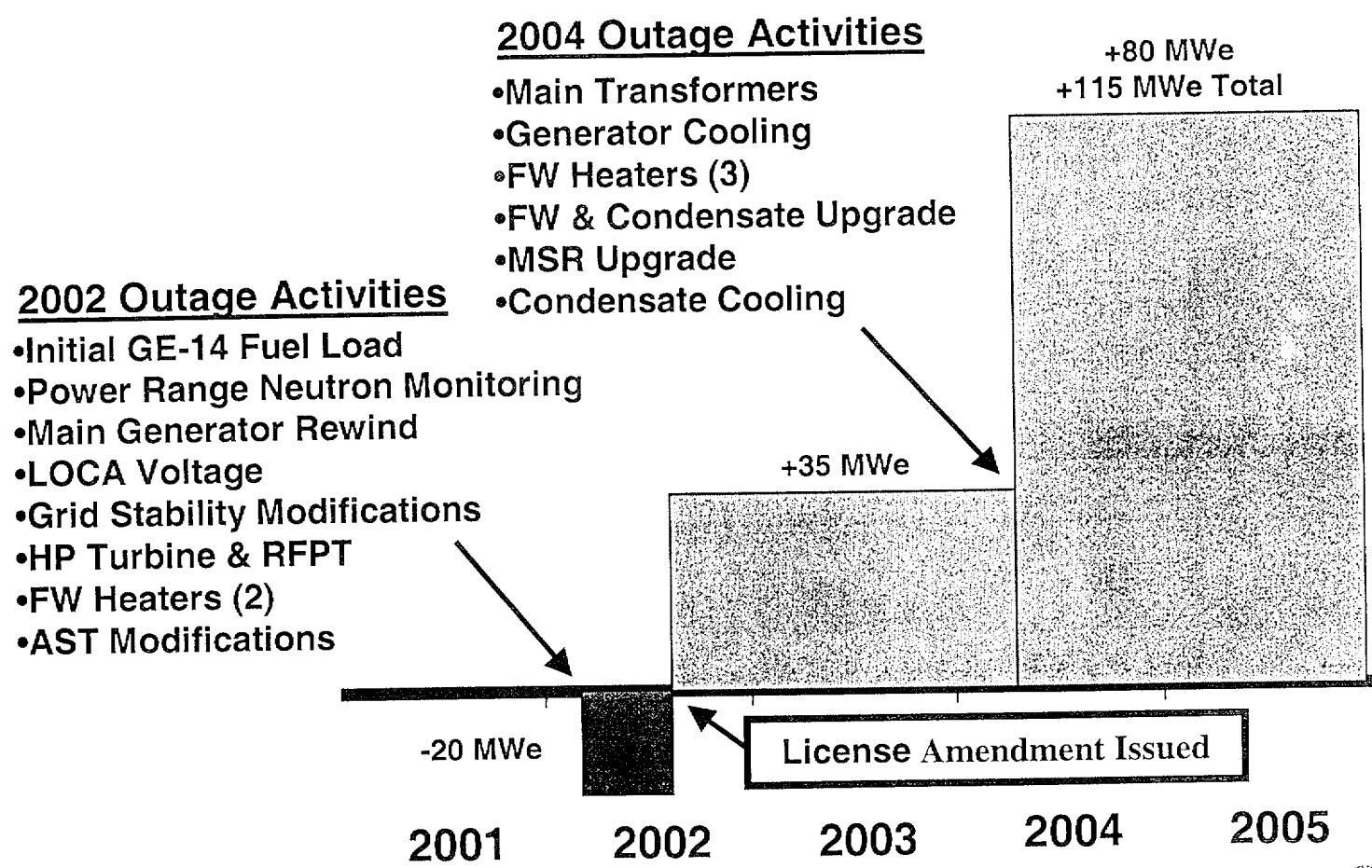
- Provide Overview of EPU Project
- Discuss Licensing Actions Necessary to Support EPU
- Highlight Potential Focus Areas for Review

# EPU Benefits

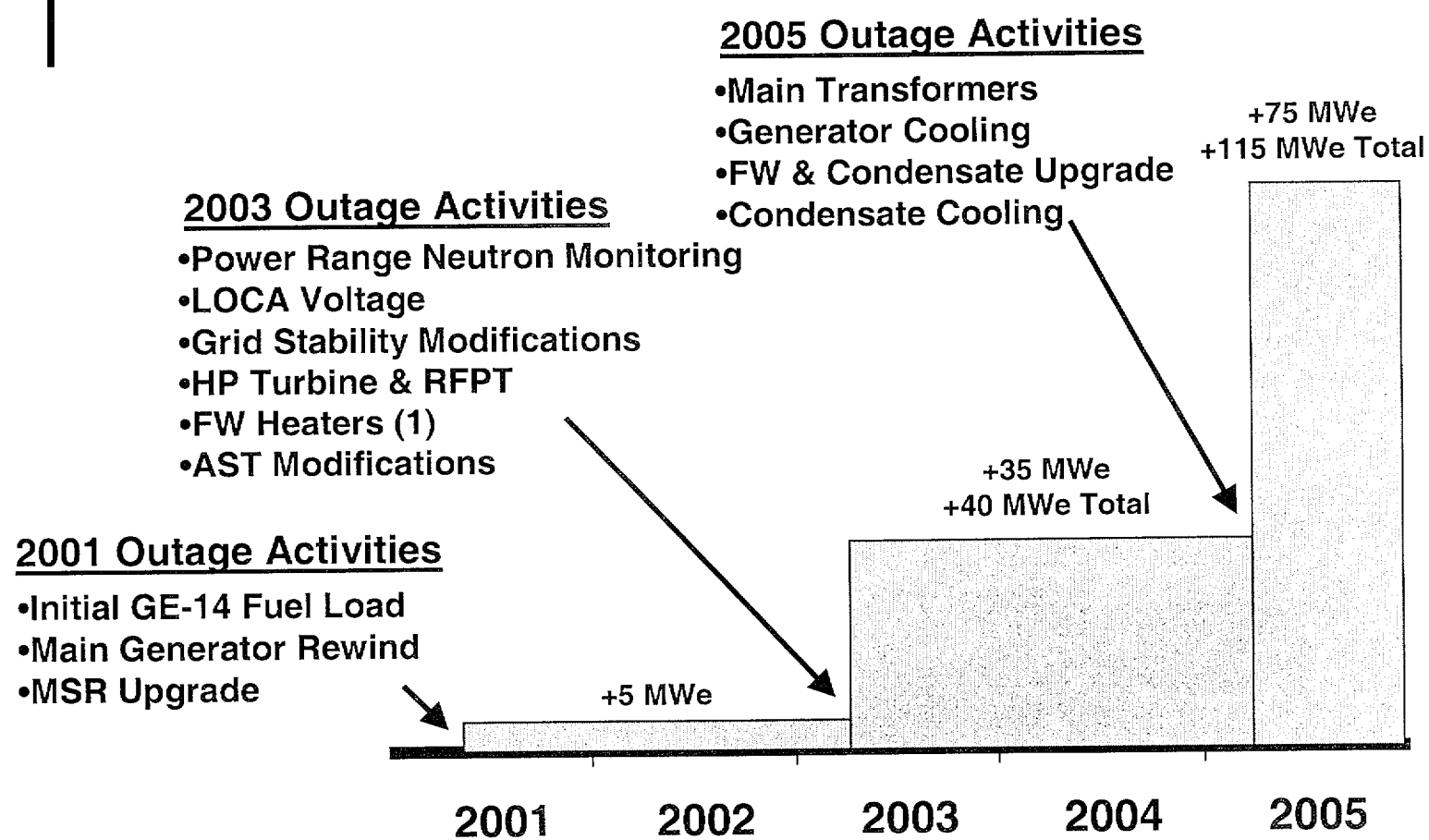
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- Design Strength and Plant Reliability Improvement
- Current Life Attainment
- Plant Life Extension
- Plant Staff Technical Capabilities

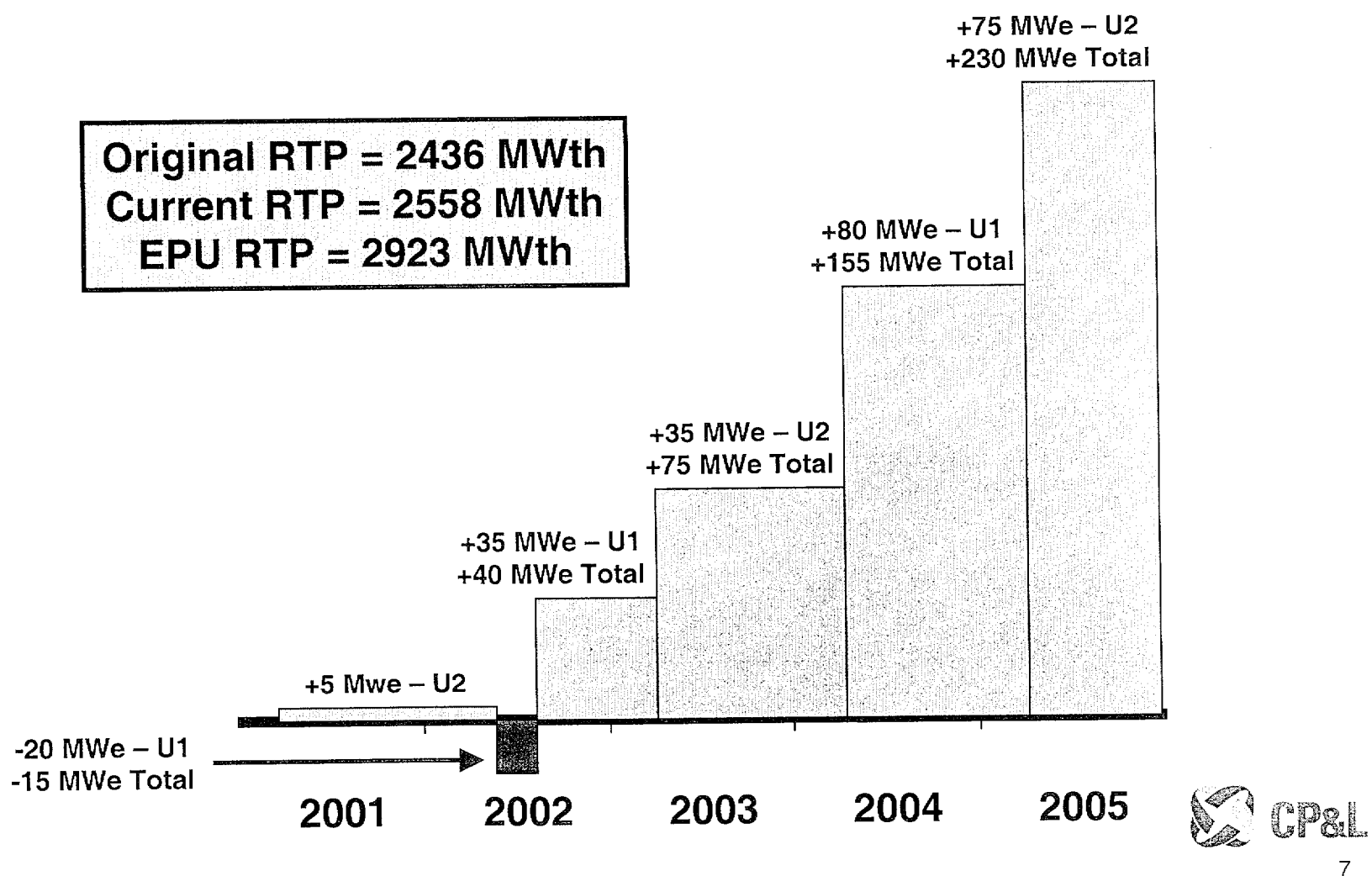
# Unit 1 Schedule and Modifications



# Unit 2 Schedule and Modifications



# Overall Generation Schedule



# Project Overview

## Testing

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- Chemistry and Radiation Monitoring
- Nuclear Instrumentation Calibration
- Core Performance
- Pressure Control Incremental Regulation
- Feedwater Level Control Regulation
- Turbine Valve and MSIV Surveillance
- Main Steam and FW Piping Vibration
- BOP System Monitoring



# Extended Power Uprate

## Licensing Status

Topic	Submittal Date	Needed Approval Date	Impact
THI Option III (Units 1 & 2)	June 26, 2001	February 2002	PRNM Hardware in Place Unit 1 Startup
Safety Limit MCPR (Unit 1)	September 18, 2001	February 2002	Needed for Unit 1 Startup with GE-14 and Uprate
Alternative Source Term (Units 1 & 2)	August 1, 2001	February 2002	RFO Secondary Containment Relaxation
		June 2002	Needed to Support Uprate Submittal
Power Uprate (Units 1 & 2)	August 9, 2001	June 2002	Unit 1 Initial Uprate
MELLLA+ (Units 1 & 2)	April 2002	February 2003	Flow Window Expansion Unit 1 Core Design
SLC (Units 1 & 2)	June 2002	February 2003	Unit 2 Startup
Safety Limit MCPR (Unit 2)	October 2002	February 2003	Unit 2 Startup



# **Extended Power Uprate**

## **Key Communications Moving Forward**

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- RAI Goals
  - ▶ 3 Week Turnaround
  - ▶ RAI Clarity and RAI Matrix
- BNP Available for Meetings As Needed
- Lessons Learned
  - ▶ ACRS
  - ▶ Duane Arnold, Dresden/Quad Cities

# Extended Power Uprate

## Plant Unique Aspects

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- Containment Overpressure
  - Currently Committed to Safety Guide 1
    - ◆ No Credit for Containment Overpressure
  - Short-Term NPSH
    - ◆ No Credit for Containment Overpressure Required
  - Long-Term NPSH
    - ◆ Maximum Required Overpressure 3.1 psig, With 11.3 psig Available
    - ◆ 5.0 psig Requested

# Extended Power Uprate

## Plant Unique Aspects

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- MSIV Closure Test Exception
  - ▶ CP&L Believes That the MSIV Closure Test Is Not Necessary
    - ◆ Industry Experience Has Demonstrated Predicted Plant Performance
    - ◆ Industry Modeling, Data Collection, and Analyses Capabilities
    - ◆ Unnecessarily Challenges Operators and Safety-Related Equipment
    - ◆ Aspects of Test Demonstrated by Component Level Testing

# MSIV Closure Startup Test Criteria

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- Minimal Heat Flux Increase/Thermal Limits Not Exceeded
- Reactor Pressure Increase Close to Predictions
- MSIV Closure Time (3 to 5 Seconds)
- SRVs Close Properly Without Leakage
- Feedwater Controls Prevent Steam Line Flooding
- RCIC Starts and Operates Without Isolating

# MSIV Closure Test Criteria

## Heat Flux Increase/Thermal Limits Not Exceeded

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- 0% Desired / 2% With Analysis
  - ▶ Scram Due to MSIV Position Switches Offsets Reactivity Increase Due to Pressure
  - ▶ Thermal Performance for Test Much Less Limiting Than Other Evaluated Transients
  - ▶ Minimal EPU Impact on Components Important to Achieving Desired Thermal Performance
    - ◆ Reactor Protection System Logic Unaffected
    - ◆ Control Rod Insertion Times
    - ◆ MSIV Closure Speed

# MSIV Closure Test Criteria

## Reactor Pressure Increase Close to Prediction

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- 120 psi Desired / 145 psi With Evaluation
  - ▶ Since Flux Transient Minimal, Depends Primarily on SRV Performance
  - ▶ BNP Analysis Assumes 2 SRVs Out-of-Service
  - ▶ Significantly Improved SRV Performance
    - ◆ No High Lift Failures During Last Two Test Sets
    - ◆ No More Than Two High Failures Since Modifications
  - ▶ SRV Performance Confirmed During Component Tests

# MSIV Closure Test Criteria

## MSIV Closure Time

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- Between 3 and 5 Seconds
  - ▶ MSIV Closure Speed Set by Actuator Adjustments
  - ▶ BNP MSIV Component Test Performance is Good
  - ▶ No Significant Industry Issues
  - ▶ MSIV Closure Times are Highly Reliable



# **MSIV Closure Test Criteria**

## **SRVs Close Properly Without Leakage**

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- SRV Setpoints Not Being Changed by EPU
- Leakage Performance Not Changed by EPU
- SRV Performance Confirmed During Routine Component Testing

# **MSIV Closure Test Criteria**

## **Feedwater Controls Prevent Steam Line Flooding**

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- Overfill at Vessel Level of 260 Inches
- FW, HPCI, and RCIC Turbines Trip at Vessel Level of 208 Inches
- BSEP Operating History Shows Significant Margin
- Minimal EPU Impact on Level Overshoot
- Turbine Trips Verified Reliable by Testing

# **MSIV Closure Test Criteria**

## **RCIC Starts and Operates Without Isolating**

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- RCIC Performance Demonstrated During Several Plant Events
- RCIC Routinely Tested per Tech Specs
- HPCI Starts Concurrently with RCIC
- Testing Would Not Confirm RCIC Capable of Maintaining Level